P-7.9 Illustrate the diffraction and interference of light.

Revised Taxonomy Level 2.2 B Illustrate conceptual knowledge

In physical science students conceptually understood diffraction of light and examples of diffraction patterns as well as constructive and destructive interference.
In physics standard P-5 students analyze the diffraction of waves.

It is essential for all students to

- Understand the circumstances under which light will diffract
  - Through a slit opening
  - Around a fine wire
  - Around a sharp-edged object
- Understand the functioning of diffraction gratings
- Understand how to use the equation

  $\lambda = d \sin\theta_n / n$

  to find the wavelength of light where
  - θ = the diffraction angle
  - d = the grating constant
  - n = the order of the image
- Understand single-slit diffraction and the patterns which are produced by this process

Assessment

The verb exemplify (illustrate) means to find a specific example or illustration of a concept or principle; therefore, the major focus of assessment will be for students to give examples that show they understand how light is diffracted causing interference. Conceptual knowledge requires that students understand the interrelationships among the basic elements within a larger structure that enable them to function together. In this case, students understand how diffraction patterns can be produced in light